

**A STUDY COMPARING THE EDUCATIONAL LEVEL AND THE DEMONSTRATED
EFFICIENCY OF ENLISTED MEN IN A UNITED STATES ARMY UNIT**

by

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B. S., University of Oregon, 1951

A MASTER'S THESIS

**submitted in partial fulfillment of the
requirements for the degree**

MASTER OF SCIENCE

College of Education

**KANSAS STATE UNIVERSITY
Manhattan, Kansas**

1968

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Major Professor

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ACKNOWLEDGMENTS

The writer is particularly grateful to his Major Professor, Dr. Charles M. Peccolo, for his guidance and inspiration throughout the course of this study.

Thanks are also extended to Dr. Richard E. Owens and Dr. O. K. O'Fallon of the College of Education, and Dr. Leon H. Rappaport of the Department of Psychology, for their help, ideas and encouragement during the course of this study.

The writer would be remiss if Colonel Norman F. J. Allen were not remembered. Colonel Allen was the writer's Commanding Officer during most of the writer's graduate studies, and it was only through Colonel Allen's humanistic understanding, compassion for his fellow man and subordinates and complete loyalty to both his subordinates and superiors alike, that the writer was able to conduct this experiment, pursue and complete his graduate studies.

The writer's wife deserves as much thanks, or more, than any other person in the world. She was a continuous inspiration and silent partner in the writer's scholarly pursuits. As the wife of a Graduate Student, who is also a Professional Army Officer and Senior Commander, on full active duty, she upheld all of the fine old traditions of the military and relieved the writer of many of his military social obligations, thus enabling him to have more time for his studies.

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CHAPTER I

INTRODUCTION

The pages of the history of civilization are filled with descriptions of the armies of one people moving against, fighting and attempting to conquer those of another. Man, who is alleged to be the most advanced creature, has historically turned to warfare to resolve international disputes and frequently internal national disputes. With the advance of civilization and increased knowledge, the means of waging war have not been neglected.

In fact, much of the knowledge gained in the past few decades has been a direct result of men seeking better ways to conquer, kill or neutralize his enemy in war. Perhaps the most classic example bearing witness to this contention is the development of the atomic bomb. Man had finally achieved a technique for the controlled splitting of the atom. This has led to the production of nuclear weapons small enough to be hand carried and used by a man in the field. As a result of these developments, the whole concept of modern warfare has changed in the past two decades. A means of protection against this devastating weapons system had to be devised. It was soon recognized that wars could no longer be fought with large massed armies opposing each other across fairly well defined lines, as was the rule as late as the close of World War II. Such large forces offered an extremely vulnerable target for a nuclear attack, and with one weapon an entire force could conceivably be obliterated. It soon became apparent that if forces

were not to present a lucrative target, they would have to disperse in the battle area to survive, but have a means to rapidly mass to attack and then disperse again to continue living.

With the adoption of this basic concept as doctrine, many other inherent problems were created. To enable field commanders to mass and disperse rapidly, light high speed fully tracked armored vehicles were developed for the infantry. These vehicles created the additional problems of logistical support, maintenance and communication for a means of control. It rapidly becomes manifest that one could proceed almost endlessly on this continuum, but suffice it to say that from the development of the one weapon, the atomic bomb, man's knowledge has not only been vastly increased, but he has had to develop the most sophisticated control and support systems for the waging of war ever required in his history.

These new innovations are plaguing all modern armies today. Even the lowly infantryman must have considerably higher skill and far more technical knowledge than did his grandfather in World War I or even his father in World War II or the Korean conflict. Therefore, if the United States is to retain its position in the world and is to survive, its soldiers must be trained to the highest possible degree in their particular military specialty. But to comprehend the highly specialized training required and to be able to effectively use it, the individual soldier of today must have a certain level of basic education.

The general educational background, skill level and technical knowledge of our soldiers today is the highest of any time in our

country's history. Recognizing that without a minimal general educational background soldiers could not be expected to learn the required skills, the Department of the Army published a regulation in which the educational goals of the army are delineated.¹ Briefly it is desired that all enlisted men will have the equivalency of at least a high school education, warrant officers are to achieve the equivalency of at least two years of college and all commissioned personnel the completion of at least a baccalaureate degree at a college accredited by a regional association.² By publishing the desired goals in the form of a regulation, commanders at all levels are enjoined to make every effort to comply with the provisions of the regulation. Unfortunately, exigencies of the service frequently make it impossible for a commander to comply with this specific regulation with the result that many enlisted men, warrant officers and commissioned officers currently on active duty have not been afforded the opportunity of achieving the established educational goals.

Upon entering the army all enlisted men are required to take the Army Classification Battery Test. This test is basically a series of aptitude type tests, but also measures the individual's knowledge in areas such as arithmetic reasoning and word utilization, to cite only

¹General Educational Development (Army Regulation No. 621-5, Headquarters Department of the Army, November 1964, as changed by change No. 1., 12 October 1965).

²Ibid. p. 4.

two of the eleven general areas.³ The main purpose of this battery of tests is to assist personnel specialists in selecting men for assignments in the army for which they are best suited. The General Information Test, which is the mathematical average of the Verbal Expression and Arithmetic Reasoning scores, is the test with which commanders generally have the most concern and is the test of primary interest to this study. The numerical result of the General Information Test, normally referred to as the GT score,⁴ is comparable to and is used in much the same manner as the IQ score so familiar to all professional educators.

Not unlike the IQ score, which unfortunately is used far too often as the determining factor for selecting which curriculum a pupil will follow in our public schools, the GT score is used by many commanders to select men for the more undesirable job assignments. Experience has taught the writer that one can not place implicit faith in the officially recorded GT scores. Unfortunately the Army Classification Battery tests are administered very shortly after a man is inducted into the army and are treated, in far too many instances, as just part of the routine in-processing. On many occasions the tests are adminis-

³Enlisted Personnel Management System (Army Regulation No. 600-200, Headquarters Department of the Army, March 1965, reprint including changes 1 through 7); For more detailed information pertaining to the components of the classification tests, see Department of the Army Pamphlet No. 310-8.

⁴Authorized Abbreviations and Brevity Codes (Army Regulation No. 320-50, Headquarters Department of the Army, June 1964) p. 26.

tered under almost unbelievably adverse conditions. This writer has personally observed inductees taking this all important battery of tests after they had been in the army only a few days, while still bewildered by what was happening to them and trying very hard to adjust to this entirely new way of life. To make matters worse, they had been subjected to rigorous physical training and had received immunization shots just prior to being escorted into an old frame building where they were to take the battery of tests. It was a very hot summer afternoon and ventilation in the building was practically nonexistent. The lighting was also very poor. To add to these already unfavorable conditions, a bulldozer was being operated in such close proximity of the building that it was difficult to hear the instructions being given by the individual administering the test. In addition to observations such as just described, many individual men have been interviewed by this writer concerning their attitude at the time they took the battery of tests. All too frequently their reply has been that as far as they were concerned it was just another form that had to be filled out and they gave absolutely no thought to the problem at hand, other than just to get it over with in the most expeditious manner possible. Based on experiences such as these, this writer developed into quite a skeptic when reviewing a man's record and his GI score appears to be low. Neither the policies governing the administration of nor the system of testing has changed materially in the past seventeen years. Therefore, one must assume that the Department of the Army considers scores obtained under the current procedures are valid, even though this

writer has reservations regarding the testing procedures and resultant scores.

Not only is the GT score used for placement, but it is one of the criteria applied when men are being considered for attendance at service schools and for promotion. The Army Schools Catalogue has numerous listings which cite as a prerequisite for attendance a specific GT score.⁵ Many of these schools are an absolute requirement if the individual man is to progress in his particular field. When being considered for promotion to the higher enlisted grades the individual is allowed points on the individual rating scale, for a GT score of 100 or more.

Another use made by the commander of the GT score is in selecting men to attend basic education courses to prepare them for retesting so they may achieve the desired educational level discussed previously. If a man has a recorded GT score of 89 or below, he is required to attend formal class one half day every day, five days a week, for a period of at least twelve weeks, or until he has demonstrated to the instructor that he has gained enough proficiency to pass the end-of-course test. Therefore, if the recorded GT score is in fact inaccurate and does not give a true reflection of the man's ability, much valuable time is wasted, not to mention the expense involved.

⁵United States Army Formal Schools Catalogue (Department of the Army Pamphlet No. 350-10, Headquarters Department of the Army, 26 February 1965, as changed by changes 1 through 32, 14 April 1967).

The intent of the Department of the Army that all enlisted men shall have a high school education is implicitly clear. However, no evidence could be found in current Department of the Army publications to substantiate the inferred contention that men with less than a high school education will not perform their duties in as acceptable or efficient manner as those men with that level of education.

Statement of the problem. It was the purpose of this study to (1) ascertain the validity of the officially recorded GT scores of the men in the selected type army unit; (2) compare the demonstrated efficiency of those men having less than a high school education and whose GT scores were eighty-nine or less, prior to this experiment with the demonstrated efficiency of men having a high school education and whose GT scores were ninety or more; (3) compare the demonstrated efficiency of those men not having a high school education and whose GT scores were eighty-nine or less prior to this experiment and their demonstrated efficiency after being afforded the educational opportunity of achieving the equivalence of a high school education during this experiment; (4) compare the demonstrated efficiency of those men having a high school education but whose GT scores were eighty-nine or less prior to this experiment with demonstrated efficiency of those men having a high school education and whose GT scores were ninety or more.

Hypotheses. It is predicted that:

- (H₁) There will be no significant difference between the GT scores found recorded in the official records prior to this experiment and the GT scores achieved upon retest

at the outset of this experiment.

(H₂) The demonstrated efficiency of those enlisted men not having a high school education and whose GT scores were eighty-nine or less, prior to this experiment, will not be significantly different from the demonstrated efficiency of the enlisted men having a high school education or its equivalence and whose GT scores were ninety or more prior to this experiment.

(H₃) There will be no significant change in the demonstrated efficiency of those men not having a high school education and whose GT scores were eighty-nine or less prior to this experiment and their demonstrated efficiency after being afforded the educational opportunity of achieving the equivalence of a high school education, during this experiment.

(H₄) There will be no significant change in the demonstrated efficiency of those men having a high school education but whose GT scores were eighty-nine or less, prior to this experiment and their demonstrated efficiency after being afforded the educational experience designed to raise their GT score to ninety or more during the experiment.

Importance of the Study. One of the most frequently heard criticisms of the army, from the civilian population and from service members alike, is the number of enlisted men who are malassigned. Fre-

quently a man with a college education will be assigned as a truck driver, cook or mechanic, instead of a position in which he could apply his intelligence and or specialized training. Conversely, some men show a high aptitude for certain jobs, but after being assigned to the duty are found not to be performing in an efficient manner simply because they do not have the basic educational background to enable them to totally comprehend the theories that must be understood if the man is to effectively accomplish his assigned task. Situations such as these usually result in the man's becoming disgruntled, which normally leads to an overall lowering of his demonstrated efficiency.

With the development of more advanced and complicated machines for the waging of war, every individual in the army must be able to accomplish his assigned job in the most efficient manner possible. It is not enough that our country can produce the weapons of war at a faster rate, of better quality and in greater quantity than any other nation in the world. Our most valuable resource, manpower, must be able to effectively use the equipment. Although official army publications, to include the specific regulations, infer that a high school education is considered the absolute minimal standard for enlisted men, no evidence is offered to substantiate the inference. In this study an attempt was made not only to furnish the required substantiation, but the period of time in the soldier's career in which the Army Classification Battery test is administered.

Limitations. The most frustrating problem encountered was the lack of stability within the test group. Due to the current world sit-

uation the army is experiencing a tremendous personnel turbulence. The result of this turbulence was that several individuals, both those with and without the desired education level, were transferred out of the unit prior to the conclusion of the experiment. In some instances the rater was transferred, but fortunately in all cases the indorser and reviewing officer remained constant throughout the experimental period. The test group was composed entirely of male enlisted personnel.

Delimitations. Only those men present for duty at the start of the experiment were included in the test group. Those men assigned to the unit but not physically present for duty being excluded. Individuals who were known to be departing the unit prior to the conclusion of the experiment were also excluded from the test group. This study was limited to only enlisted men regardless of their rank or position within the unit. Every effort was expended to insure that all men in the test group were assigned to and rated in positions in the unit for which they had been previously trained. However, no attempt was made to differentiate between men assigned to different jobs within the unit. The individual's socioeconomic background, race, religion or geographic origin were not considered in this study. No differentiation was made between those men who enlisted in the army and those men who had been drafted under the selective service program. Although the men in the experimental groups only attended school for one half day, the second evaluation report was not submitted on any of the men in the test population until thirty days after the men had completed their educational experience, thus allowing members in the evaluation chain an opportunity to observe the evalutees for a full duty day for at

least one month before the final CER was submitted.

Definitions of terms used. It is believed that the only terms requiring clarification are those which the army has assigned specific definitions to and therefore they may not carry the same connotation as they have in general use. Those terms and standard army abbreviations used in this study which the writer believed required elaboration are:

1. GT Score. The standard army abbreviation for an individual's general technical aptitude. The score, as it appears in a soldier's personnel record, is obtained by dividing the sum of the scores he has obtained on the verbal and arithmetic reasoning portions of the Army Classification Battery test by two. This score, more than any of the other results obtained from the Army Classification Battery test, is considered and used by commanders and assignment specialists alike as being the individual's IQ.⁶

2. CER. The standard army abbreviation for Commander's Evaluation Report. This report is used to evaluate job performance and other factors not covered by other evaluations rendered on enlisted men. This report is submitted at prescribed intervals on Department of the Army form 2166.⁷

3. Rater. The rater is normally the immediate supervisor of the individual being rated. Enlisted personnel designated as raters must

⁶op.cit. Authorized Abbreviations and Brevity Codes. p. 33.; and Administering and Scoring the Army Classification Battery (Department of the Army Pamphlet No. 611-100, Headquarters Department of the Army, 8 August, 1961, as changed by change 1, 21 May, 1962).

⁷op.cit. Enlisted Personnel Management System. p. 5-14.

be in the pay grade of E-6 or above and must be one pay grade higher than the individual being rated.⁸

4. Indorser. The indorser is required to be rater's supervisor. The indorser must be of a higher grade than the rater and in an appropriate supervisory position over the rater.⁹

5. Reviewing officer. The reviewing officer will be a warrant or commissioned officer who supervises the indorsers. He is further required to insure that proper raters and indorsers are appointed and that they complete the DA form 2166 in an accurate and objective manner. If in the opinion of the reviewing officer the ratings are not accurate and objective, the report is returned to the rater and indorser for re-evaluation.¹⁰

6. MOS. The standard army abbreviation for Military Occupational Speciality. The MOS is normally designated by a combination of numbers and letters designating the type job, skill level and rank of the individual possessing that particular representation of his MOS. The MOS is comperable to the man's job title.¹¹

7. GED test. Common army abbreviation for the title "United States Armed Forces Institute, General Education Development Tests".

⁸Ibid. p. 5-15.

⁹Ibid. p. 5-16.

¹⁰Ibid. p. 5-16.

¹¹op.cit. Authorized Abbreviation and Brevity Codes. p. 33.

The successful completion of the GED test is recognized by the army as the equivalence of a high school education.¹²

8. Group I. That group of men in the population with a high school education, its equivalence or higher and whose officially recorded GT scores prior to this experiment were 90 or above.

9. Group II. That group of men in the population with a high school education, its equivalence or higher and whose officially recorded GT scores prior to this experiment were 89 or less.

10. Group III. That group of men in the population without a high school education or its equivalence and whose officially recorded GT scores prior to this experiment were 89 or less.

¹² op.cit. General Educational Development. pp. 4 and 34.

CHAPTER II

REVIEW OF RELATED LITERATURE

Research for this study, other than for official documents, regulations and pamphlets, was initially conducted in the library of Kansas State University and the Fort Riley Special Services Library. The publications library of official documents maintained by the post Adjutant General, Fort Riley, Kansas, was utilized to gain information contained in official Army Regulations and Pamphlets. Unfortunately, except for the official regulations and pamphlets, no previous studies nor information having a direct relationship to this study were found.

Being frustrated in attempts to gain pertinent information locally, the assets of the George Washington University, Human Resources Research Office, which operates under contract with the Department of the Army¹; Personnel Research Laboratory, Aerospace Medical Division, Air Force Systems Command²; and the Defense Supply Agency, Defense Documentation Center³, were explored. Again no studies which examined the exact prob-

¹More detailed information concerning this organization may be obtained by writing to: The Chief, Human Resources Research Office, 300 North Washington Street, Alexandria, Virginia 22314.

²More detailed information concerning this branch of the Air Force may be obtained by writing to: Director of Operations 6570th Personnel Research Laboratory (AFSC) Lackland Air Force Base, San Antonio, Texas 78236.

³More detailed information concerning this activity of the Defense Department may be obtained by writing to: Director, Defense Supply Agency, Defense Documentation Center, Cameron Station, Alexandria, Virginia 22314.

lem under consideration in this study could be found; however, studies were discovered which examined other aspects of military concern.

Business and Industry. Many studies have been and are currently being conducted for and by business concerns and industry to determine the desired background and training for individuals applying for or being considered for placement. By the same token both have conducted studies on the efficiency of their employees.

It was discovered that the business world was having difficulty in attracting and retaining, what the business leaders considered to be, the really intelligent young college graduates. John S. Fieldman discussed this problem in an article which appeared in the Harvard Business Review.⁴ Fieldman pointed out that many of the more intelligent college graduates and most of those who were classed as intellectuals were not choosing careers in business. In fact, according to Fieldman, individuals in these categories have a tendency to actually not even consider careers in business. Additionally, Fieldman pointed out, that if a career in business is initially chosen, far too many of the individuals considered as very intelligent are leaving the business world. Most of these individuals considered as being very intelligent were apparently leaving the business world to take positions in industry in which higher remuneration was offered earlier in their careers, and those considered as intellectuals were returning to graduate schools to pursue advanced

⁴John S. Fieldman, "The Right Young People for Business", Harvard Business Review, 44; April - March 1966, pp. 76-77.

studies in their chosen discipline.⁵

In the area of attempting to determine efficiency and productivity of employees, Steven C. Brandt, faculty member of the Golden Gate College, San Francisco Staff, published an article in which he coined the advertising axiom, "I know that half of the money I spend to train people is wasted, but I don't know which half", as a prelude to a discussion on how employers can check their operation in an attempt to determine the efficiency of their personnel.⁶ Brandt suggested a five point check list, which he claimed if utilized by employers as he advised would not only increase the efficiency of the employers but overall productivity.⁷

The difficulty of training and retraining poorly educated, or virtually illiterate, personnel for such routine positions as aircraft production line workers has been borne out by an experiment conducted by the Ling-Temco-Vought Aerospace Corp., Dallas, Texas.⁸ In this experiment the officials established several training centers throughout Texas where they trained migrant farm workers, most of whom were of Spanish-American descent, in an attempt to fill 6,000 employee vacancies. Company officials discovered that by the time they had filled the 6,000 vacancies with a stabilized work force they had recruited and

⁵Ibid. p. 82.

⁶Steven C. Brandt, "Are They Really Learning the Ropes?", Nations Business, 55:8, August 1967, pp. 75-77.

⁷Ibid. p. 77.

trained almost 10,000 individuals. In 1968 the company is contemplating expanding and will require 7,500 more production line employees. The officials have estimated that to achieve this goal they will have to recruit and train over 12,000 personnel from the present ranks of the migrant workers.⁹

Three reasons appeared to be the greatest causative factors in the reported low rate of retainability. These were:

- (1) Inability of the recruit to learn even simple procedures because of lack of education.
- (2) Lack of motivation, especially to improve himself materially.
- (3) Inability on the part of the individual to stabilize himself in one locale.

These three examples are presented only as representative examples of the type of research and experimentation that has been done in the business world and by industry. The writer, however, did not believe that the procedures used nor the results of the studies conducted by such civilian enterprises are actually applicable to this study because of the vast difference between the civilian and military settings.

Some of the representative differences considered by the writer were:

- (1) The individual's freedom of choice. If a civilian became

⁸ Editors report, "Migrant workers to be trained for Aircraft Production Jobs", Aviation Week and Space Technology, 87:7, August 14, 1967, pp. 127-28.

⁹ Ibid. p.128.

training in a specific field such as electronics, he is still considered a basic soldier first, a specialist second. Therefore, it was concluded that the soldier's daily duties were far more diversified, even though he was a highly skilled technician, than the civilian employee.

For these specific reasons, and others which paralleled them, the writer did not consider studies conducted in a civilian setting to be totally relevant to this study.

Human Resources Research Office. Mr. Saul L. Lavisky, Chief Documents Librarian, Human Resources Research Office was interviewed over the telephone by the writer. During the conversation the concept of the study, scope, method and hypothesis were discussed in detail. Mr. Lavisky advised that he would place the information in the computer system of the library and forward to the writer any studies relating to the current problem. During the interim he forwarded a copy of the Bibliography of Publications as of 30 June 1967.¹⁰ Mr. Lavisky returned the writer's telephone call and advised that although over eight-hundred studies had been conducted by the Human Resources Research Office, none could be discovered which had any direct relation to this study.

Representative of the many studies conducted for the Department of the Army by the Human Resources Research Office was a study conducted

¹⁰ Human Resources Research Office, Bibliography of Publications, as of 30 June 1967, (Alexandria, Virginia: George Washington University, 1967) pp. 1-252.

by Victor B. Cline, Alan Besis and Dennis Seidman.¹¹

The problem examined in that study centered in two general areas - that of increasing the soldier's performance level at the end of the standard eight week basic training course, and the attainment of the desired standards in a shorter time.¹² Also possibilities for more efficient utilization of high aptitude personnel were examined with special attention being given to their comparative performance.

Cline, Besis and Seidman concluded that the high-aptitude men achieved the desired standards in the designated four-week basic training period and made no significant gains by being required to complete the standard eight-week program. Middle and low aptitude men, however, did benefit significantly from the eight-week program.¹³

The first results of another study, conducted by the Human Resources Research Office, were released during the period this problem was being conducted.¹⁴ The researchers, S. James Goffard, Morris Showel and Hilton M. Bislek examined the status of men in Mental Category IV, based on the Armed Forces Qualification Test, who were undergoing Basic Combat Training. Category IV personnel being defined as

¹¹Human Resources Research Office, Evaluation of Four-week and Eight-week Basic Training for Men of Various Intelligence Levels, (Alexandria, Virginia: George Washington University, Technical Report No. 32, November, 1956) p. 3-41.

¹²Ibid. p. 3.

¹³Ibid. p. 5.

¹⁴Human Resources Research Office, A Study of Category IV Personnel in Basic Training (Alexandria, Virginia: George Washington University, Technical Report No. 66-2, April 1966) pp. 3-33.

those men in the ten to thirtieth percentiles.¹⁵ These men were compared in terms of background characteristics, experiences, and achievements in Basic Combat Training with men in mental categories above the thirtieth percentile.

These researchers concluded, in part, that the category IV men were, "... on the average, inferior to men in higher mental categories in measures of aptitude and of achievement in Basic Combat Training, particularly on measures demanding verbal and symbolic abilities, there is very extensive overlapping of the two groups, particularly on measures of performance."¹⁶

Although it was recognized that neither of these two examples had a direct bearing on the current problem, since all of the subjects of this experiment had completed both Basic Combat Training and Advanced Individual Training and none were classified as Category IV personnel. The writer believed it essential to include them as representative of the type of studies conducted by the Human Resources Research Office for the Department of the Army

Department of the Air Force. Dr. Leland Brokaw, Director of Operations, 6570th Personnel Research Laboratory (AFSC), Lackland Air Force Base, San Antonio, Texas, 78236, was next interviewed by the writer. During the telephone conversation the general concept of this study was explained, in detail, to Dr. Brokaw. After the conclusion of the con-

¹⁵Ibid. p. 3.

¹⁶Ibid. p. VI.

versation a draft copy of Chapters I and III of this study were forwarded to Dr. Brokaw at his request. Dr. Brokaw was most co-operative and sent to the writer copies of several studies conducted by researchers associated with the Air Force Personnel Research Laboratory.

It was discovered that the Department of the Air Force, like the Department of the Army, had apparently expended a great deal of research effort in the personnel field. Two of the studies are discussed here to give the reader some insight into the broad range of areas in which research has been conducted by the staff members of the Air Force Personnel Research Laboratory.

In 1963, Ernest C. Tupes completed a study in which attendance by officers at a basic type school was related by multiple regression analysis to their later performance as reflected by the Officer Effectiveness Reports, submitted by their commanders.¹⁷

Tupes investigated two questions. The first was if attendance at the Squadron Officer School resulted in an increase in officer effectiveness, and the second was whether those officers who achieved higher grades in the Squadron Officer School were more effective later in their careers than officers achieving lower grades. The criteria of effectiveness selected were the Officer Effectiveness Reports rendered on each of the officers in the two years immediately following the Squadron

¹⁷Ernest C. Tupes, Relationships Between Attendance at Squadron Officer School and Later Officer Effectiveness Reports, 6570th Personnel Research Laboratory, Aerospace Medical Division, Air Force Systems Command, Technical Documentary Report PRL-TDR-63-10 (Lackland Air Force Base, Texas, April, 1963).

Officer School.¹⁸

The results of Tupes' investigation revealed that there were no differences found which could be attributed to either attendance or nonattendance at the Squadron Officer School. Class standing while attending the school was also found to have no significant correlation with later performance or effectiveness of the subject officers.

Another study, conducted at the center by William B. Lecznar, which examined education as a predictor of technical training success, was most interesting and considered somewhat more relevant to this study than any other study discovered by the writer.¹⁹

In this study Lecznar attempted to confirm previous findings regarding the number of years of formal education as a predictor for success of airmen in technical training. To this objective, a series of predictor combinations were analyzed to define the combination of years of education in the predictor system.²⁰

Lecznar found that the years of education as the only continuous variable was not as good nor accurate a predictor of the final success of airmen in technical training as were aptitude tests alone.²¹

¹⁸Ibid. p. III.

¹⁹William B. Lecznar, with an appendix by J. W. Bowles and Frank B. Ford, Years of Education as a Predictor of Technical Training Success, 6570th Personnel Research Laboratory, Aerospace Medical Division, Air Force Systems Command, Technical Documentary Report PRL-TDR-64-2 (Lackland Air Force Base, Texas, February, 1964).

²⁰Ibid. p. 4.

²¹Ibid. p. 10.

Although the first of these studies, cited by types, attempted to establish a relationship between an educational experience and later efficiency or effectiveness, the writer did not consider it to be really pertinent to the present problem. The basic reason being that in Tupes' study only officer personnel were involved. In the present problem officers are entirely excluded and the writer did not believe that an attempt to replicate a study involving only officer personnel with a study involving only enlisted personnel would have any meaning whatsoever.

Leczners' study was considered somewhat more relevant, and indicative of an interest in what effect the educational level of airmen had on success in specialized technical training. The writer, however, did not believe that Lecznars' study was examining the same problem area as the current study, and therefore the results of his study would not lend credence to the results of this study. Lecznar was interested mainly in determining how to best predict the ultimate success of enlisted men selected to attend specialist training after completion of their basic training. The current problem was examining what effect, if any, formal education had on the demonstrated efficiency of enlisted men after they had completed their advanced individual and or specialized training.

Defense Documentation Center. In a final effort to discover literature relating more directly to the problem under consideration, the writer contacted by telephone Mr. Fred Meyer, Chief of the Bibliography Section, Defense Supply Agency, Defense Documentation Center, Cameron

Station, Alexandria, Virginia. After discussing in detail the title and the problems under consideration in this study, an agreement was reached on a group of key words which could be converted for use in the center's computer system. Mr. Meyer notified the writer that nothing more than what has already been cited could be found in the center's library.

Based on the negative results of the many attempts to locate literature which had a direct relationship to this study or was considered by the writer to be apropos, it became apparent that this was a pilot study in the area of attempting to determine if there was any relationship between the educational level of enlisted men who had completed their Basic Combat Training, Advanced Individual Training, and or specialist schooling and their demonstrated efficiency after their assignment to an organized unit.

CHAPTER III

DESIGN AND PROCEDURE

Research design. This study was designed as a longitudinal, field type experiment. The object of the investigation was to determine the validity of the GT score recorded in the individual soldier's official army record; and to compare the demonstrated efficiency of those enlisted men not having a high school education or its equivalence, at the beginning of the experiment, with the demonstrated efficiency of enlisted men who had a high school education. The men not having a high school education were provided with an educational experience which culminated in their achieving the equivalence of a high school education after which their demonstrated efficiency was again compared to the group having had a high school education at the outset of the experiment. The actual study itself covered a period of approximately eight months from the time the initial data were obtained and analyzed. The basic idea for the experiment was born from the desire to improve the overall efficiency and productivity of the writer's military organization. It could therefore well be defined as action research, but it was believed that it could equally as well have been regarded as applied research.

Population. The population from which the samples were taken was as good a representative cross section of the United States as a researcher could hope to find. Virtually every state in the Union, including Alaska and Hawaii, was represented, as were several foreign

countries, both European and Oriental. The socioeconomic backgrounds of the individuals constituting the population were equally as depictive of the United States as the geographical representation. The entire spectrum of occupations, ranging from the most menial of positions to lawyers and professional educators, was represented by those men who had left their parents' home and were earning their own living. Not unlike a typical civilian community, there was that fraction of our general population who had run afoul of the law and have had to pay their debt to society by serving a sentence in a penal institution. It was believed by citing these few examples, the fact that the population from which the samples were selected did in fact give an excellent portrayal of the male population of the United States.

These men were organized into four distinct companies within the same combat support type battalion. Two of the companies being Direct Support Light Maintenance units identical in organization and mission. To give some insight into the variety of skills, above the routine clerical and logistical personnel, such as cooks and supply specialists, required to be present in all units, the assigned missions of the four companies comprising the battalion will be quoted in part. The two Light Maintenance companies are designed to "Provide direct support maintenance, limited evsuction, and maintenance supply support to non-divisional units in the field army press ... Provides maintenance support for small arms and instruments on a direct exchange basis."¹

¹Table of Organization and Equipment, Light Maintenance Company (DS)
(TOE 29-207F, Headquarters Department of the Army, 20 March 1967) p. 1.

The third company, the Battalion Headquarters and Main Support Company (DS), had a comparable mission but on an expanded scale as exemplified in the following partial quotation from its assigned mission. "Provides command, administration and technical supervision of the Maintenance Direct Support Battalion ... Also serves as a base of supply for the maintenance battalion."² The last unit in the battalion was an entirely different type unit from the other three just described. Whereas the main concern in the aforementioned units was repair and maintenance, this company had the mission of establishing and operating an area for the "... receipt, storage and issue of all items of conventional ammunition (Chemical and Ordnance, excluding CBR warheads and missiles), bulk toxics, and certain high intensity, low maintenance missiles in support of troop units within the field army. ... Performs GO-NO-GO testing of the Redeye Weapon Round prior to issue to the using unit and semi-annual surveillance sample testing of the Redeye Weapon Rounds in ammunition field storage."³

When one considers the vast inventory of equipment and ammunition in the army, it becomes readily apparent that many highly technical skills were required in the units just described if they were to perform their assigned mission in an efficient manner.

²Table of Organization and Equipment, Headquarters and Main Support Company (DS) (TOE 29-206F, Headquarters Department of the Army, 3 March, 1965) p. 1.

³Table of Organization and Equipment, Ordnance Company (Ammo) (TOE 9-17E, Headquarters Department of the Army, 26 February 1965) p. 1.

All men in the test population had completed their basic and advanced individual training prior to being assigned to the battalion. Virtually every major training center in the United States being represented, it had to be assumed that all men knew their speciality at the level to which they were assigned.

It was believed that the above cited facts substantiate the writer's contention that, not only was the test population a very good representation of the male population of military age in the United States as a whole, but the multitude of varying skills required in the units was an equally good portrayal of the general enlisted male population in the army.

Sample. Realizing the extreme personnel turbulence being experienced by the army during the period that this study was being conducted and fearing that many of the subjects would be lost during the experiment, no attempt was made at selective sampling. Every enlisted man assigned to the battalion was initially considered as part of the test population. Those men who were assigned or attached, but who were not physically present for duty in the unit, were automatically eliminated from the test population. Next the personnel records were screened and those individuals who were known to be departing the unit for any reasons, such as discharge or being transferred to another unit, prior to the expected completion date of the experiment were also excluded from the test group. Having thus eliminated all known losses from the population, all remaining enlisted men assigned to the battalion became an integral part of the experimental or test group.

Although there were officially 613 officers and enlisted men assigned to the battalion when the experiment was started, only 481 enlisted men were found who satisfied the above cited criteria of retention initially established for selection to the test group. After having thus established the test population, the officially recorded GT score and educational level was determined from the personnel records for every individual comprising the selected test population. Three hundred seventy-eight enlisted men had a GT score of 90 or above and a high school education, its equivalence or higher; these men were assigned to test group I. Forty-five enlisted men had a high school education, its equivalence or higher and an officially recorded GT score of 89 or less; these men constituted test group II. The remainder, fifty-eight enlisted men, those without a high school education or its equivalence and whose officially recorded GT scores prior to this experiment were 89 or less formed test group III.

Measuring Instruments. All men comprising the test population were evaluated by at least two measuring instruments, the CER and the Army Classification Battery test. The enlisted men in groups II and III were evaluated by a third instrument, the GED test.

Printed information pertaining to the objectivity, validity, reliability and useability of the three measuring instruments is not in wide distribution. In fact the writer could find no information in any of the libraries utilized for his research. It was determined from the Fort Riley Test Control Officer that this type of information was considered privileged information and was made available only on request

of individuals or institutions having a definite need for the information.

Mr. Paul G. Berge, Chairman of the Test Research and Developments Branch, Education Division, United States Armed Forces Institute, Madison, Wisconsin, was interviewed on July 25, 1967, by telephone regarding the GED test. The reasons for desiring the information were explained to Mr. Berge who then furnished the following pertinent information regarding the GED test and gave his permission to use both his name and information furnished in this study.

The objective of the GED test is to determine if an individual who has not completed a formal high school program has acquired the same comprehension of the general subject matter courses as an individual who has completed a formal high school program three to four years after graduation. The skill courses such as English Composition and Mathematics have specific objectives and are more directly related to the actual classroom experiences.

Officials of the United States Armed Forces Institute exert every effort to insure that the GED test is valid. Subject matter specialists from every discipline are continuously reviewing and revising that portion of the test related to their specific field of interest with particular attention being directed toward the content, to insure that it is current and is in fact achieving the desired objectives.

In conjunction with their procedure of insuring validity, there had been implemented a program of periodically testing the reliability of the GED test. Every three years an equating administration of the

test is conducted. This encompasses the selection of a standardized test population from at least 100 high schools. The test is administered to this test population and the scores achieved on the new revised test are equated with the scores from the old test. A complete standardization was conducted every thirteen years; however, a program has been initiated to reduce the period of time from thirteen years to not more than ten years between complete standardizations. When the test is completely standardized, the test population is expanded to over 800 high schools throughout the United States and the scores are then correlated. The test currently in use has slightly over a .90 reliability, when computed using the Kuder-Richardson Formula 21.

The test itself is actually classified by the officials of the United States Armed Forces Institute as being an achievement test; however, they readily admit that it can equally as well be considered as an ability test. Although not just any individual can administer or score the test, it is considered to be a very useable instrument. Every major military installation has an education officer or center which will test all members of the armed forces within the geographical limits serviced by the installation. All completed tests must be sent to Madison, Wisconsin, for scoring. Copies of the results are then sent to the testing agency, the individual's commanding officer for inclusion in the man's records, and to the individuals concerned.⁴

⁴More detailed information may be obtained by writing to the Chairman Research and Development Branch, Education Division, Department of Defense, United States Armed Forces Institute, Madison, Wisconsin, 46216.

Dr. Harry Kaplan, the Assistant for Tests, United States Army Behavioral Science Research Laboratory, The Pentagon, Washington, D.C., 20310, was interviewed on 26 July 1967, by telephone, concerning information pertaining to the Army Classification Battery test. Dr. Kaplan gave his permission to use his name and the information furnished by him regarding the Army Classification Battery test in this study.

The Army Classification Battery test is an objective test. In reality it is eleven separate aptitude area tests which are administered to an individual or group of individuals consecutively, requiring approximately four hours to complete the entire battery.

The average validity of the Army Classification Battery test when combined into the aptitude area composites has been determined by evaluating success in training of selected test groups of soldiers. The average validity thus established is .54 for the predicting of success in training, this being the correlation between the test results and the degree of success achieved in training in all MOS skills in the Army. No attempt was made by the writer to determine the validity of the Army Classification Battery test for all MOS's in the Army nor for all of the subjects in the test group. The writer believed that because of the large number of MOS's in the Army and the test group alike, that such a listing would become overly long and that in reality it would add nothing to this study.⁵ To give the reader some indication

⁵Enlisted Military Occupational Specialties (Army Regulation No. 611-201, Headquarters Department of the Army, 5 January 1967) 1213 pp.

of the spread in the correlations, however, four of the more common MOS's were examined by the writer. The validity for predicting success in training for an infantry soldier was found to be .39; for motor maintenance personnel .59; electronics specialists .58; and for clerical personnel .62. It became readily apparent that before any expression for the validity of the Army Classification Battery test to be meaningful, one would first have to determine which specific MOS he was interested in and then seek information pertaining to his specific area of interest.⁶

To establish the reliability coefficient of the Army Classification Battery test, the test-re-test after a twenty-four hour time lapse method was employed by the researchers at the United States Army Behavioral Science Research Laboratory. At the time of this study the reliability coefficients of only eight of the eleven sub-tests of the entire battery had been computed. The highest reliability coefficient reported being a .74. The reliability coefficients reported were determined using the Pearson Product Moment. Although the reliability coefficient was determined on a test-re-test with a twenty-four hour time lapse, the Army Regulation governing the administration of the Army Classification Battery test prohibits retesting an individual

⁶Information regarding any specific MOS can be obtained by writing to: The Chief of the United States Army Behavioral Science Research Laboratory, The Pentagon, Washington, C. C., 20310.

until at least six months have elapsed since last being tested.⁷

The Army Classification Battery test was found to be very easy to use, but time consuming. The test itself and the answer sheets were standard in the Army at the time of this study. An individual is allowed almost four hours to complete the entire test, and the scoring for a group of forty to fifty tests requires almost an equal amount of time. The test must be administered by a qualified officer or noncommissioned officer who has been appointed on official Army orders as the test control officer or test control noncommissioned officer. This does not normally create a problem since every Army installation is required to have such an individual appointed to the position of test control officer or noncommissioned officer. Additionally a building in which there are as few external distractions as possible was found to be highly desirable. A place for the individual being tested to write also had to be provided. Fortunately for the writer the Fort Riley testing center was well staffed, physically situated in an excellent location and adequately equipped.

The primary measuring instrument used in this study was the CER. It is unlike the GED or the Army Classification Battery tests in that it is a subjective type evaluation which relies upon the rater's and the instructor's observations. In an effort to obtain credible information concerning this instrument, Mr. Dale R. Baker, Supervisory Research

⁷Enlisted Personnel Management System (Army Regulation No. 600-200, Headquarters Department of the Army, March 1965, reprint including changes 1 through 7) pp. 5-14 through 5-17.

Psychologist, Chief of the Analysis Branch and Mr. Michael J. Bodi, Research Psychologist, Evaluation and Analysis Branch, both assigned to the United States Army Enlisted Evaluation Center, Fort Benjamin Harrison, Indiana, were interviewed by conference type telephone on 26 July 1967. Again after the purpose of desiring the information was explained, both gentlemen were most co-operative in furnishing information and readily agreed that their names and the information they supplied could be used in this study.

Although the CER is subjective in nature, both agreed that experience has indicated that the test must be considered reasonably objective. There had developed throughout the Army, however, a bunching of the scores with relationship to the enlisted man's rank; the higher the rank, the higher the evaluation. For this reason a new evaluation form had been developed, tested and will be replacing the form utilized in this study at a future date.

The form used in this study had been in the general use throughout the Army since April 1963, and many reliability tests have been conducted by the Enlisted Evaluation Center. The reliability coefficient, as computed using the Pearson Product Moment, fluctuates between .40 and .50. Although, in absolute terms, this coefficient appeared to be very low, the test was still considered reliable because of the nature of the instrument and the fact that there is a tremendous personnel turnover in the Army which directly affects the evaluation chain.

The validity as computed using the Pearson Product Moment fluctu-

ates between .30 and .40. Again the officials at the Enlisted Evaluation Center considered this to be valid, applying the same rationale as they did in accepting the apparently low figures reported for the reliability coefficient as being reliable.

This instrument was extremely easy to use since it was a standard Army form and easily obtained in quantity. The major caution being that the members of the rating chain must be properly oriented if any degree of reliability is to be achieved.⁸

Description of the Program. Having decided on the type, design and the measuring instruments to be used in the study, the method of collecting data that would be as valid as possible was attacked.

Initially, two enlisted men who did not meet the required retainability criteria were selected to assist in gathering the background data. Both enlisted men were college graduates and had been professional educators prior to being drafted into the Army. One of the men had applied for Officer's Candidate School and had passed all requirements for selection. It was therefore assumed that, due to the shortage of officer personnel in the Army, he would be selected for attendance and would be departing the command prior to the completion of the experiment. The second man was to be discharged from the service before the anticipated termination of the study. Both were advised that they did not have to participate in any manner if they did not want to. It

⁸More information concerning the CER can be obtained by writing to: The Commanding Officer, United States Army Enlisted Evaluation Center, Fort Benjamin Harrison, Indiana.

was the writer's desire to have strictly volunteers as assistants because it was believed their motivation to make a worth-while contribution would be greater than a man who had been ordered to work on the study. The men were fully oriented on the concept of the study, the role they would have and what was expected of them. The requirement for unbiased, objective recording and factual reporting of data was emphasized. Both men readily accepted the positions and proved to be ardent and conscientious workers.

In an effort to obtain as valid and objective evaluation of the population as possible, unit rosters were screened and discussed personally with each of the company commanders to ascertain who the raters and the indorsers actually were. Having thus insured that all individuals in the evaluating chain satisfied the requirements contained in the current Army Regulation⁹, a ten hour block of instruction, given in two hour class periods for five consecutive days, covering the importance, meaning, use and proper technique of completing the CER was scheduled for all personnel in the evaluating chain in the battalion. This group was not advised of the forthcoming experiment. The reason being that it was not considered advisable because of the influence the knowledge might have on the evaluations they would be completing in the near future. Secondly, the majority of those in the class would become an integral part of the test population, although they were totally

⁹ Op.cit. Enlisted Personnel Management System. pp. 5-14 through 5-17.

unaware of this fact. The ten hour block of instructions was presented by officers and noncommissioned officers who were all personnel specialists from the Post Adjutant General's office. Each of the twelve items that a soldier is evaluated on was discussed in detail. Practical work consisted of each individual being given several word pictures of hypothetical soldiers and being required to complete a CER on the soldier in the problem. After all students had completed their individual solution to the problem, by completing the CER, the instructor had several give their evaluation to the entire class, requiring them to justify each entry they had made on the CER. These solutions were discussed with the entire class and any person having a different entry could so state, but he too had to justify his selection. The instructor then gave what the evaluation actually should have been had the students applied the principles taught during the previous periods of instruction. By the end of the block of instruction there was a high degree of consistency between and among the students who actually comprised the evaluation chain.

The writer believed that the Hawthorne and Halo effects were both negated in the group of students, because schools for both officers and noncommissioned officers covering specialized duties that they are required to perform are encouraged by the Department of the Army and were required by Headquarters Fort Riley at the time of this study.

Having thus trained those individuals who would be supplying the raw data, each company was required to submit a complete roster of all personnel assigned. The official records of the entire battalion were

then screened to determine the individual's GT score as officially recorded, date and place of original test, date of discharge, present duty status and assignment, home of record, parent's occupation, his own occupation prior to entering the service, and the level of education completed. The established criteria were then applied to the entire group of enlisted men and the test population was selected. The test population was then divided into the three experimental and control groups.

While the above actions were being completed, coordination was accomplished with the Post Adjutant General to finalize the plans for administering the Army Classification Battery test to the entire test population. The Post Education Officer was also contacted and requested to renew his campaign to get more individuals enrolled in the Basic Education courses leading to a high school equivalency; this he gladly and enthusiastically accomplished. The purpose for this request was to give the writer a legitimate reason for requiring maximum participation in the educational program by members of the population, without arousing suspicion in the experimental groups, or any other individual in the organization. Further, the Post Education Officer was requested to give priority in scheduling to the men of the experimental groups requiring placement tests and the GED test if indicated. Both officials were most understanding and cooperated to their utmost after the study was explained to them.

Being assured of the cooperation of the chiefs of the two agencies vital to the experiment, the company commanders were advised that a CER was to be submitted on each man in their company. They were allowed

three days in which to accomplish the task. The company commanders were given a detailed briefing concerning the experiment and their cooperation was solicited. The briefing was considered essential even though the commanders were in the evaluating chain. As reviewing officers they were in a position to know the men, raters, and indorsers, thus being able to ensure that the CERs submitted from their unit were valid. All commanders were admonished not to inform the troops of why the CER was being submitted, or of any of the particulars concerning the experiment. All commanders cooperated and the CERs were received in the prescribed time. There was no evidence that any of the commanders or the two assistants divulged any of the evidence concerning the experimental procedures during the experimental period. When all of the CERs had been received, those of the men comprising the test population were separated from the others, and then were further divided into the three predetermined experimental groups, based on the individual's educational level and original officially recorded GT score. Three hundred seventy-eight men were in Group I, forty-five in Group II and fifty-eight in Group III.

After the test population had been thus divided into the three experimental groups, the date that each individual had last taken the Army Classification Battery test had to be confirmed to ensure that at least six months had elapsed since the individual had last been tested.¹⁰ All selected individuals in the experimental groups were found to satisfy the time requirement and were subsequently administered the Army Clas-

¹⁰ op.cit. Enlisted Personnel Management System. p. A1-1.

sification Battery test. Due to the limited space and availability of testing materials only forty men could be tested at one time. The experimental groups in each company were divided into forty man increments without regard to which of the three experimental groups personnel actually belonged. If there were not enough men in one company to complete a group of forty, personnel from another company were utilized to augment the group and fill it out so that each of the testing sessions had as near forty individuals as possible. All men were tested in the same building, on consecutive days and by the same test administrator. The men were not advised why they were being retested, only that they were being given the opportunity of retaking the Army Classification Battery test and that their new scores would be entered on their personnel records.

The building in which the testing was accomplished was the established testing hall used to administer all evaluation type tests for enlisted personnel at Fort Riley. Although it was a World War II cantonment type frame building, it was surrounded by large shade trees, which tended to keep it relatively cool and also act as baffles for external noise. It had been modified to the degree that there was good ventilation and lighting. It was physically located in an area in which there is very little traffic and during testing periods, the street adjacent to the building was blocked off to preclude any distraction from passing vehicles.

Due to the large number of men being tested in a relatively short period of time, the staff of the test center was augmented by the

writer's two assistants to help with the administrative details of scoring and recording the new GT scores achieved by the test population. All scores were verified by the Fort Riley test control officer and the writer checked a random sample of twenty-five percent of all of the tests. The time required for the process of scoring the tests and recording the scores was equal to, if not more than, the time required to actually administer the test. After all tests had been scored and verified, the men comprising the experimental groups were reassigned to one of the three categories based on their new, and what the writer considered more valid, GT score. Only seven men originally assigned to Group I were reassigned to experimental Group II, but seventeen of the men originally in Group II gained enough on the retest to qualify for Group I. The reassignments resulted in Group I having 388 men assigned to it and Group II had a total of 35 men.

Arrangements were then accomplished at the Fort Riley Education Center for the thirty-five men in Group II and the fifty-eight men in Group III to be enrolled in the appropriate basic education class. All men were enrolled and started attending formal classes one half day, five days each week.

During the course of the experiment many men in the original test population were lost to the experiment. The vast majority of the men were transferred to the combat zone in Viet Nam; a negligible number were reassigned to units in the United States. At the end of the experimental period only 301 of the original 481 men were left in the test population; 239 men in experimental Group I, forty-five in Group

II and only twenty in Group III. Although there were only twenty men left in Group III to receive final evaluation, some twenty-three others were able to complete their formal education and successfully pass the GED test prior to departing the unit.

When the Education Advisor notified the writer that the men had completed their schooling and had successfully passed the GED test, an effort to give the men a feeling of accomplishment was made. Each individual's name was published in the Battalion Daily Bulletin, the Post Newspaper and a news release citing the fact that the man had achieved his high school equivalency was sent to his home town newspaper. Copies or reproductions of these releases are not included in this study because the unit in which this experiment was conducted would thereby be identified. Army Regulations prescribed that, if the results of any experiment conducted in the Army by any person or agency are to be published and the unit is identified, permission must first be obtained from the Chief of Information, Department of the Army, The Pentagon, Washington, D.C., 20310.¹¹ In addition the individuals were honored at a battalion retreat parade by being placed on the reviewing stand and being designated as the official reviewing party. It was considered that these publicity steps were essential for the individual's ego and self concept, and might therefore have a direct bearing on his demonstrated efficiency in the performance of his duties. Had the men grad-

¹¹Army Information (Army Regulation No. 360-5, Headquarters Department of the Army, 27 September 1967) p. 8.

uated from his hometown high school, he would have had his name in the paper and participated in a commencement exercise, thus being honored by his community for completing high school. So these steps were really nothing more than his community, the Army, giving him recognition for completing the equivalence of a high school education.

After the men in experimental Groups II and III had completed their GED test, had received their recognition and had been in their respective units for thirty days, another CER was submitted on all of the men in the test population. It was believed that it was essential to have the men back to their units for a minimum of thirty days before having the second evaluation submitted, because for several weeks prior to the time that they returned to their companies they had only been in the unit area for one half day, and in many instances resentment toward the men was noted. It was believed that after thirty days of full duty any animosity that might have actually developed because the men was attending school, would be forgotten and the raters and the indorsers would have had a reasonable length of time to observe the men in performing their assigned duties.

Analysis of data. The measuring instruments used in this study lent themselves to statistical analysis. The t-test was used to test whether the mean difference in the scores was significantly different from zero. Utilizing this method, the t-value revealed an answer in terms of acceptance or rejection of the null hypothesis at the desired level of confidence.

The analysis of variance was used to determine if the independent

variable, the educational experience, did in fact have any effect upon the enlisted men in the experimental Groups II and III. If an observable fact is detected and it is at the desired level of confidence, the null hypothesis can be rejected.

According to most literature, a .01 level of significance is ordinarily considered a high level of control and that a .10 level of significance is so low a level of control that it is seldom used in educational research. In this study a compromise between these two levels, a .05 level of significance, was used.¹²

¹² Charles Peccolo, The Effect of Thermal Environment on Learning: A Pilot Study, Iowa Center for Research in School Administration, (Iowa City, Iowa: University of Iowa) p. 13.

CHAPTER IV

FINDINGS

The first null hypothesis (H_1) that there will be no significant difference between the GT scores found recorded in the official records prior to this experiment and the GT scores achieved upon retest at the outset of the experiment was tested by conducting a t-test on the means of the individual groups. Table I reflects the analysis of difference in GT means. The Mean of the Differences in GT scores was 5.3809, 2.777, and 7.500 for Groups I, II, and III respectively. The Standard Deviation for the groups, expressed in the same sequence, was 9.0455, 10.1977 and 11.5853. When the t was calculated for each of the groups it was determined to be 11.5657 for Group I, 1.8272 for Group II and 4.9302 for Group III. The findings for Groups II and III being significant at the 0.05 level of confidence.

Applying the theory of the Least Significant Difference to the data, the Differences Between the Means were evaluated to determine if they were significant. The difference between Groups I and II was 2.603; between Groups I and III, 2.119 and between Groups II and III 4.722. All of the findings were discovered to be significant at the 0.05 level of confidence. (Table II)

Using Bartlett's test of homogeneity of variance and two degrees of freedom, Chi-square was determined by the computer center and reported to be 7.3144. No supporting data were furnished the writer on the computer print-out from which the reported results could be depicted

TABLE I
ANALYSIS OF DIFFERENCES IN GT MEANS

Group	Sample Size	Mean of Differences (D)	Standard Deviation	t
I	378	5.3809	9.0455	11.5657 *
II	45	2.7777	10.1977	1.8272
III	58	7.5000	11.5853	4.9302 *

* Significant at the 0.05 level of confidence

TABLE II
SIGNIFICANCE OF DIFFERENCES BETWEEN MEANS IN GI SCORES

	MEANS OF GROUP	GROUP II	GROUP III
Group I	5.381	2.603 *	2.119 *
Group II	2.778	-----	4.722 *
Group III	7.500	-----	-----

* Significant at the 0.05 level of confidence

figuratively or in tabular form. The reported result of the Chi-square, however, was found to be significant at the 0.05 level of confidence.¹

An analysis of variance, F-Test, was then accomplished on the data and found to be 3.1368. This finding was determined to be significant at the 0.05 level of confidence.² The supporting data and final results are depicted in table III.

The second null hypothesis (H_2) that the demonstrated efficiency of those enlisted men not having a high school education and whose GT scores were eighty-nine or less prior to this experiment, will not be significantly different from the demonstrated efficiency of the enlisted men having a high school education or its equivalence and whose GT scores were ninety or more prior to this experiment was tested in the same manner as was the first null hypothesis (H_1).

Table IV depicts the Significance of Differences between the Means in Demonstrated Efficiency of the three groups as determined by applying the theory of Least Significant Difference. The computed difference of 13.026 between the mean of Group I and Group II was the only difference determined to be significant at the 0.05 level of confidence.³ The difference of 7.799 between the means of Groups I and III and the computed difference of 5.228 between Groups II and III were not significant at the desired level of confidence.

¹E. F. Lindquist, Design and Analysis of Experiments in Psychology and Education (Boston: Houghton Mifflin Company, 1956), p. 38.

²Ibid. p. 40.

³Ibid. p. 41.

TABLE III
ANALYSIS OF VARIANCE IN GT SCORES

Sources	Degrees of Freedom	Sums of the Squares	Means of the Squares	F-Test
Treatments	2	565.3153	282.6576	3.1368 *
Error	478	43073.4206	90.118	
Total	480	43638.7360		

*Significant at the 0.05 level of confidence

TABLE IV
SIGNIFICANCE OF DIFFERENCES BETWEEN MEANS IN DEMONSTRATED EFFICIENCY

	Means of Groups	Group II	Group III
Group I	4.351	13.026 *	7.799
Group II	17.738	-----	5.228
Group III	12.150	-----	-----

* Significant at the 0.05 level of confidence

Table V depicts the analysis of differences of means in demonstrated efficiency between and among the groups. The means of the differences in demonstrated efficiency were found to be 4.3515 for Group I, 17.3778 for Group II and 12.1500 for Group III. The standard deviation for the three groups, expressed in the same sequential order, were found to be: 20.4112, 17.8991 and 17.7683. The t-test was then applied to the data to determine if there were any significant change in the mean scores in the demonstrated efficiency of the individuals within the three groups. The t for Group I was found to be 3.296, for Group II, 6.531, and for Group III, 3.058. Each of these results of the calculated t were found to be significant at the 0.05 level of confidence.⁴

Bartlett's test of homogeneity of variance and two degrees of freedom was then applied. Chi-square was reported by the computer center to be 1.6652, although no supporting data were furnished from which a table or figure could be constructed. The reported value of 1.6652 for Chi-square, however, was determined to be significant at the 0.05 level of confidence.⁵

Based on this finding the F-Test, analysis of variance, was then conducted. F was determined to be 8.8853, which was significant at the 0.05 level of confidence.⁶ Data supporting this determination are contained in table VI.

⁴Ibid. p. 39.

⁵Ibid. p. 38.

⁶Ibid. p. 40.

TABLE V
ANALYSIS OF DIFFERENCES OF MEANS IN DEMONSTRATED EFFICIENCY

Group	Sample Size	Mean of Differences (D)	Standard Deviation	t
I	239	4.3515	20.4112	3.296 *
II	45	17.3778	17.8991	6.531 *
III	20	12.1500	17.7683	3.058 *

* Significant at the 0.05 level of confidence

TABLE VI
ANALYSIS OF VARIANCE OF MEAN SCORES OF DEMONSTRATED EFFICIENCY

Sources	Degrees of Freedom	Sums of Squares	Mean of the Squares	F-Test
Treatment	2	7040.3393	3520.1697	8.8853 *
Error	301	119249.6048	396.1981	-----
Total	303	126289.9441	-----	-----

* Significant at the 0.05 level of confidence

The third null hypothesis (H_3) there will be no significant change in the demonstrated efficiency of those men not having a high school education and whose GT scores were eighty-nine or less, prior to this experiment, and their demonstrated efficiency after being afforded the opportunity of achieving the equivalence of a high school education, during this experiment was tested. By definition this hypothesis referred specifically to Group III.

When the theory of Least Significant Difference was applied to the data it was found that the differences between Group III and Groups I and II were 7.799 and 5.228 respectively. It was found that neither of these differences was significant at the desired level of confidence. The complete data leading to these differences are contained in table IV.

In analyzing the differences of the means in the demonstrated efficiency of the three groups it was discovered that the difference for Group III was 12.1500. The differences in the means for the other two groups were found to be 4.3515 for Group I and 17.3778 for Group II. The standard deviation in Group III was determined to be 17.7683 while the standard deviation for Group II was 17.8991 and for Group I it was 20.4112. Again the t-test was used to determine if there was any significant change in the mean score achieved by the groups and in particular Group III. The calculated t for Group III was determined to be 3.058; the t for Group II being 6.531 and the t for Group I being 3.296. The t value of 3.058 for Group III was discovered to be significant at the 0.05 level of confidence. (Table V)

The fourth null hypothesis (H_4) examined in this study - that there

would be no significant change in the demonstrated efficiency of those enlisted men having a high school education but whose GT scores were eighty-nine or less, prior to this experiment, and their demonstrated efficiency after being afforded the educational experience designed to raise their GT scores to ninety or more during the experiment - was considered concurrently with the second and third hypothesis described above. This hypothesis was, by definition, concerned with the enlisted men who comprised Group II.

Table IV, Significance of Differences Between Means in Demonstrated Efficiency, contains a tabular comparison of the three groups. The difference in the means between Group II and Group III was only 5.228, which was not significant at the 0.05 level of confidence. The difference between Group II and Group I was 13.026 which was significant at the desired level of confidence. In fact this difference was the only significant difference discovered when the theory of Least Significant Difference was applied.

When the mean of the differences was examined, Group II had the largest gain of any of the three groups. The difference for Group II being 17.3778 while Group I showed only a 4.3515 difference and Group III a 12.1500 gain. The computed standard deviation, however, did not reveal as large a spread as the differences in means. The standard deviation for Group II was computed to be 17.8991, for Group I, 20.4112 and for Group III, 17.7683. The t-test was applied to ascertain if the reported gains were, in fact, significant. The t, as calculated for Group II, was found to be 6.531, which was determined to be significant

at the 0.05 level of confidence, 3.296 and 3.058 being the calculated value of t for Groups I and III respectively. (Table V)

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary. The purpose of this study was twofold. First, the validity of the officially recorded GT scores for the individual enlisted men in a typical United States Army unit were examined; secondly a comparison between the individual soldier's formal educational level and his demonstrated efficiency while working in his MOS in an active United States Army unit was made. The initial data for this study was obtained from the official United States Army Personnel records, maintained by the Post Adjutant General, Fort Riley, Kansas, on the individual soldiers assigned to the organization selected for this experiment.

To test the validity of the officially recorded GT scores, all enlisted men comprising the test population were readministered the Army Classification Battery test and their resultant GT score computed. In all cases at least six months had elapsed since the individual soldier had last taken the Battery of tests.

The comparison of the enlisted men's educational level and his demonstrated efficiency was somewhat more involved. After administering the Army Classification Battery test and computing the individual GT scores, all personnel in the test population were assigned to one of three groups. Group I were those men whose GT scores were ninety or higher and who had a high school education, its equivalence or higher. Group II were men whose GT scores were eighty-nine or lower, but who also had a high school education, its equivalence or higher. Group III

was comprised of men who are known as the "high school drop-outs" in the current American culture. These men had not completed high school, or its equivalence, and all had a GT score of eighty-nine or lower. The three cited categories, or groupings, were not arbitrarily selected by the writer, but were three educational categories described by the Department of the Army. A CER was then prepared on each individual in the test population, and the numerical score for each individual was computed. Those men in Group I, which was the control group, continued working in their assigned MOS. The men comprising Groups II and III were sent to formalized schools designed to improve their GT scores and prepare them to take the GED test, thereby achieving their high school equivalency. After having completed their schooling the men were returned to their units and assumed their assigned duties as prescribed by their MOS. After all men had been in their units for at least thirty days, another CER was submitted on all men in the test population and the numerical score on this second CER was computed for each individual.

The t-test was utilized to determine if there was a significant difference in the GT scores and in the demonstrated efficiency of the enlisted men. The analysis of variance was used to determine if the independent variable, the readministering of the Army Classification Battery test and the educational experience, did in fact have any effect upon the enlisted men in Groups II and III.

It was found that for all of the groups there was a gain in the mean of the GT scores between the officially recorded score and the score achieved on the retest at the outset of this study. Groups I and

III gained enough for the differences to be significant at the 0.05 level of confidence, whereas Group II showed a gain which was not of the magnitude to be significant. When all three groups were considered as a whole, however, and the F-Test was applied, the entire test population made a gain which was significant at the 0.05 level of confidence.

The t-test revealed that all groups made a significant gain in demonstrated efficiency during the period of time this study was being conducted. When comparing the experimental groups those receiving additional formal education to achieve the equivalence of a high school education or to improve their GT score with Group I the control group it was discovered that the only significant improvement at the 0.05 level of confidence in the demonstrated efficiency of the enlisted men was the comparison between Groups I and II.

Conclusions. The first null hypothesis (H_1) - it is predicted that there will be no significant difference between the GT scores found recorded in the official records prior to this experiment and the GT scores achieved upon retest at the outset of the experiment - was rejected for Groups I and III, but was accepted for Group II when the groups were considered individually. When the groups were not considered individually, however, and the difference in the means for the entire population was computed, the null hypothesis for the group as a whole was also rejected. (Table VII)

When the second null hypothesis (H_2) - it is predicted that the demonstrated efficiency of those enlisted men not having a high school education and whose GT scores were eighty-nine or less, prior to this

TABLE VII

SUMMARY OF DIFFERENCES OF GROUP MEANS IN GT SCORES AND DEMONSTRATED EFFICIENCY, F AND t-TESTS

	Diff of Grp Means in GT Scores	Diff of Grp Means in Dem Eff	F-TEST		t-TEST	
			GT	DEM EFF	GT	DEM EFF
Group I	5.381	4.351	:	:	:	11.5657*:3.296*
Group II	2.778	17.378	:	:	:	1.8272 :6.513*
Group III	7.500	12.150	:	:	:	4.9302*:3.058*

* Significant at the 0.05 level of confidence

** F-Test was calculated for the entire population by the computer center, not by group
Finding significant at the 0.05 level of confidence

experiment, will not be significantly different from the demonstrated efficiency of the enlisted men having a high school education or its equivalence and whose GT scores were ninety or more prior to this experiment - was examined. It was determined that although the enlisted men in Group III did in fact make a gain in their demonstrated efficiency during the course of this study, when compared to the gain recorded by those men in Group I, it was not significant. Therefore, the null hypothesis was accepted. (Table VII)

In examining the data pertaining to the third null hypothesis (H_3) - that there will be no significant change in the demonstrated efficiency of those men not having a high school education and whose GT scores were eighty-nine or less, prior to this experiment, and their demonstrated efficiency after being afforded the educational opportunity of achieving the equivalence of a high school education, during this experiment - one must recall that only Group III personnel are being considered. As indicated above, there was a gain in the demonstrated efficiency of the men in Group III, but not of a magnitude to be significant in comparison to the gain made by Group I personnel. When this gain was computed, using the t-test, it was discovered that the change was significant at the desired level of confidence. The data supporting the conclusion rejecting the third null hypothesis (H_3) are contained in Table VII.

The fourth null hypothesis (H_4) - that there will be no significant change in the demonstrated efficiency of those men having a high school education but whose GT scores were eighty-nine or less, prior to

this experiment, and their demonstrated efficiency after being afforded the educational experience designed to raise their GT score to ninety or more during the experiment - was the only hypothesis comparing the groups pertaining to the demonstrated efficiency that was rejected totally based upon the results of both the t-test and the F-test. This hypothesis was actually comparing the gains made by those men comprising Group II with the men in Group I. Table VII contains the data on which the conclusion to reject this null hypothesis is based.

Discussion. In analyzing the results of the t-test pertaining to the GT scores, as it was applied to the individual groups, the writer believes that the results were not in fact surprising. It must be remembered that many of the men in Group I - those men having a high school education, its equivalence or higher and a GT score of ninety or more - had attended institutions of higher education and a considerable number had graduated from a college or university. As a group then, it was assumed that the men were more conditioned to taking written examinations, especially those tests relying heavily on verbal expression and arithmetic reasoning. Since at least a six month period of time had elapsed since last being examined, it was surmised that the gains achieved by the individuals in Group I might well be attributed to factors other than the subject matter contained in the examinations.

It was the writer's opinion that the period of time in the soldier's career in which the Army Classification Battery test was administered was perhaps the greatest single factor in causing the enlisted men to perform poorly on the test. Army regulations prescribed that the indi-

vidual would take the test within five days of his entering the service. To the writer, this was a very poor time psychologically to administer an instrument to an individual that had as far reaching effects as the Army Classification Battery test; for during the first five days of a soldier's career he is not only confused and bewildered, but he is having to adjust to an entirely new environment. The result of these combined pressures frequently caused the new soldier to develop a defeatist attitude and when confronted with the task of taking the Army Classification Battery test, he did not realize its importance, considered it just another harassment in his already harried life. He, therefore, all too frequently rushed through the test as rapidly as possible, giving little or no thought to the answers he selected for any given question.

Very closely allied to the psychological condition of the individual was another factor, which the writer considered material, that of the physical surroundings in which the test was administered. When the individual was uncomfortably warm or cold, could not hear instructions and the light was so poor he must strain to read the examination and there was so much noise from outside the testing room that it was distracting, the individual could not be expected to perform at his best. These conditions were controlled, to a degree, during this study and it was believed that the individual's psychological condition coupled with the physical surroundings were two major contributing factors leading to the significant gain in GI scores recorded by Group I.

These same factors, it was believed, were the major contributors to the increase noted in Group II. These were the men with a high

school education, its equivalence or higher and whose GT scores were eighty-nine or less prior to this experiment. It was concluded that having had all of the advantages that the enlisted men of Group I had, that these enlisted men had, in fact, performed at their maximum capacity when they initially took the Army Classification Battery test. The disadvantages of testing early in their careers apparently had no grossly adverse effects upon them. Furthermore, it was concluded that even though the mean of the gain was only approximately three points, this study helped those men who had initially scored eighty-seven to eighty-nine on the test. After the retest based on the assumption that their individual score increased at least as much as the mean for the group, they would be in much better position for future schooling and promotion. Therefore, although not statistically significant the writer concluded that the gain was of practical significance.

The final group considered, Group III, were those men not having a high school education or its equivalence and whose GT scores prior to this experiment were eighty-nine or lower. The men in this group also benefited from the retest and controlled testing conditions. Of significance to the writer was the fact that this group achieved the greatest numerical gain, 7,500, in the differences between the means of the two testing situations.

Reflecting on this the writer concluded that, these men, perhaps for the first time in their lives, had a sense of security, had learned to appreciate what price they actually had to pay for not having completed their education and having initially done poorly on the Army

Classification Battery test. As a result of these factors, it was believed that these enlisted men were more highly motivated to excel on the retest than either of the other two groups.

When all three groups were considered as a whole, the differences in the means were significant. It was believed that all the factors discussed above contributed to this finding. In addition the relatively small number of individuals in Group II coupled with the fact that they did achieve a gain caused the writer to conclude that the large numerical gain achieved by group III, although a very small group numerically, and the substantial gain made by Group I, were of such magnitude as to negate the relatively small gain recorded for Group II.

In analysing the results relative to the second null hypothesis (H_2), which compared to the gain in demonstrated efficiency of the men in Group III with the gain recorded by the men in Group I, the writer believed that although both groups gained in experience, Group I - those men having a high school education and a GT score of ninety or higher - actually developed greater proficiency in their assigned duties than the men in Group III. The major factor considered in reaching this conclusion was that the men in Group I remained at their assigned duties during the entire period covered by this study, while the men in Group III attending formal schooling at least one half day every day most of the time the experiment was being conducted. Therefore, it was concluded that although basically both groups were at approximately the same level of MOS training, the extrinsic learning acquired by the men in Group I, though on-the-job training on a continuing daily basis,

coupled with the facts that they had a higher degree of formal education and GT scores initially were enough to cause their gain in demonstrated efficiency to be of such a magnitude that it was impossible for the men in Group II, who did not have these initial advantages, to achieve gains of statistical significance. Another fact that had to be considered was that Group III lost almost two thirds of its subjects during the course of the study. The result of this loss was that only twenty individuals remained in this group for the final analysis. The writer concluded that this large loss in personnel was the major factor for the small recorded difference in the group means.

These observations, however, did not lead the writer to conclude that an insignificant gain was made by Group III. When the results of the t-test were examined the writer concluded that those individuals in Group III, as a group, did gain significantly in their demonstrated efficiency after their educational experience.

Those men in Group II, which were considered in the fourth null hypothesis, comprised the only group which showed a statistically significant gain in their demonstrated efficiency when compared to Group I. This finding, however, was not surprising to the writer, since these men had completed high school, or its equivalence prior to this study and were enrolled in a course of formal education during this study, designed to improve their basic understandings and comprehension. This coupled with the fact that their efficiency was being measured by how well they performed their assigned tasks. The writer believed that although these men, as a group, were not able to express themselves well

on a written instrument, such as the Army Classification Battery test, requiring arithmetic reasoning and verbal usage, they were able to apply their knowledge in a most efficient manner in practical situations. Hence, it appeared that these men subconsciously having the assurance afforded by the knowledge that they had completed high school or its equivalence enabled them to devote their full attention to their assigned tasks, thus showing a significant gain in the demonstrated efficiency for the entire group.

Implications. Rejection of the first null hypothesis (H_1) reveals that there was a significant difference in the means of the GT scores for the test population during this study. This finding implied several things to the writer.

First, that the administration of the Army Classification Battery test in the first five days of an enlisted man's career was entirely too early. Based on this study, it appeared that the administration of this test should be postponed as long as possible in the enlisted man's Basic Combat Training cycle.

Secondly, the fact that there was a significant difference between the means of the officially recorded GT scores and the GT scores achieved on retest implied that troop commanders and assignment specialists should indeed be very careful in accepting the officially recorded GT score as being a true representation of a man's ability. Blind acceptance of the GT score and ultimate "pegging" or "slotting" of a man as being unable to master a situation because he apparently does not have the mental capacity based solely on the GT score can be not only a great injustice

to the man but to the unit as a whole.

Another implication that was drawn by the writer was that the individual testing center itself contributed greatly to the score achieved on the Army Classification Battery test by an individual man. A center that was well equipped, situated in a location which minimized external distractions and was staffed by well-trained, competent administrators would afford the enlisted man the best opportunity of achieving a GT which was truly representative of his capacities.

The acceptance of the second null hypothesis (H_2) did not carry the implication to the writer that important gains had not been achieved by the personnel who did not have a high school education and whose GT scores were eighty-nine or less at the beginning of this study. The finding only emphasized that those men who had at least a high school education and a GT score of ninety or higher did, in fact, perform better on the job and thus achieve a higher rating on their demonstrated efficiency. This implied that if a military commander desires to develop a highly efficient organization, he should make every effort to improve the educational level of his enlisted men.

This implication was further strengthened by the findings relative to the third and fourth null hypotheses, (H_3) and (H_4) respectively. By rejecting both of these null hypotheses, the obvious implication appeared to be that one of the best tools a military commander has available to him for improving the overall efficiency of his unit is the educational program offered on all military posts through the education centers.

Finally if the results obtained in this study were to be accepted or better yet at least questioned at the policy making level of the Army, for more sophisticated studies on a much larger scale could be initiated for more verification of the findings and conclusions reached in this study.

Recommendations. The writer accepted the established fact that eight-weeks was the optimum period of time for Basic Combat Training.¹ But based on the findings of this study, which led to the ultimate conclusion that the first null hypothesis (H_1) should be rejected, it is recommended that the period of time in which the Army Classification Battery test is administered to enlisted men be postponed until the seventh week of Basic Combat Training. This postponement would still allow the assignment specialists in the personnel sections time to determine what Advanced Individual or Specialist Training the soldier was best suited for, notify the respective training centers and prepare the appropriate orders assigning the men to the new training post. More important, the writer believes that by postponing the test the new soldier would be in much better psychological condition to take the test, and hence the results would have a tendency to be more valid.

In conjunction with the proposed delay, it is strongly recommended that all testing centers be critically inspected. The purpose of these inspections being to ensure that the testing center is equipped with the best available equipment, situated in as ideal a location as possible

¹op.cit. Evaluation of Four-Week and Eight-Week Basic Training for men of Various Intelligence Levels. p. 6.

and that the personnel assigned to the centers are fully qualified to administer and score all examinations.

By implementing these recommendations the writer believes that far more credence could be placed in the officially recorded GT scores. Additionally it is believed that the number of poorly or totally malassigned enlisted men in the Army could and would be greatly reduced.

Based on the findings regarding the demonstrated efficiency of the enlisted men in this study it is recommended that current Army Regulations be reviewed and changed from indicating a desire that enlisted men have a high school education or its equivalence, to requiring that they have at least that level of education. It is further recommended that at the time of induction, if the man does not have at least a high school education that he be sent immediately through an educational program designed to raise his formal education to at least that level. A program of this type would definitely enhance his learning in Basic Combat and Advanced Individual or Specialist Training and would be a more efficient method of accomplishing the desired educational level. If this were adopted, then when a man joined his first active unit after training, he would be much better prepared and the unit could utilize him on a full time basis instead of having to send him to school, thus cutting down the available number of men to accomplish the unit mission.

Perhaps one of the best uses, in a preventative aspect, that could be made of this study is in the civilian school systems, especially by the counselling staffs at the secondary level. If the results of this study were afforded to the potential "drop-out" in the proper manner by

highly trained personnel, the writer became convinced that this might well be a major factor in precluding a boy from leaving high school. If this study were so used and it resulted in causing one potential "drop-out" to remain in school, the writer would consider that the study was entirely worthwhile, even if none of the other recommendations were adopted. Therefore, it is recommended that the results of this study be made available to civilian educators, especially the professional counselling staffs at the secondary level.

Finally it is recommended that several more studies examining the same hypotheses as were examined in this study be conducted under more controlled conditions. The one major control the writer recommends be rigorously implemented being that of stabilizing the test population. Once the test population has been selected it is recommended that they not be transferred until the study is completed. Additionally it is believed that the study should be of longer duration, allowing the men who had to achieve the equivalence of a high school education more time back with their units on a full duty basis before the final CER was submitted.

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**A STUDY COMPARING THE EDUCATIONAL LEVEL AND THE DEMONSTRATED
EFFICIENCY OF ENLISTED MEN IN A UNITED STATES ARMY UNIT**

by

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AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Education

**KANSAS STATE UNIVERSITY
Manhattan, Kansas**

1968

The purpose of this study was to compare the formal educational level of enlisted men with their demonstrated efficiency while working in their assigned MOS. All men in the test population were administered the Army Classification Battery test, and the GT scores obtained were compared with the officially recorded GT scores in the men's official records prior to the outset of this study.

After all men had been retested and their new GT scores computed, the entire test population was divided into three experimental groups. Group I were those men having a GT score of ninety or higher and who had a high school education or its equivalence; Group II were men who had completed high school or its equivalence but whose GT scores were eighty-nine or less; Group III was comprised of men whose GT scores were eighty-nine or less and who did not have a high school education or its equivalence; these groupings being based on Army Regulations, not just arbitrary divisions devised by the writer.

A CER was then submitted on all men in the test population. After all men had been rated, the men comprising Groups II and III were sent to formalized schools designed, respectively, to improve their GT scores and prepare them to take the high school level GED test, thereby achieving their high school equivalency. After all men had completed their schooling and had been returned to full duty status in their respective units for at least thirty days, another CER was submitted on all men in the test population. During the period that the men in Groups II and III were attending school, the men in Group I, which was considered the control group, continued to work full time in their assigned MOS's.

It was discovered that there was a significant difference between

the officially recorded GT scores and the GT scores achieved on the retest, conducted at the outset of this study, for the men in Groups I and III; and although gains were recorded by the men in Group II, on the retest, they were not of enough magnitude to be significant at the 0.05 level of confidence. The population as a whole, however, gained to a degree that was statistically significant at the desired level of confidence. All three groups gained significantly in their demonstrated efficiency during the course of the study.

It was concluded that the officially recorded GT scores, which were required to be recorded within the first five days a man was in the Army, were of questionable validity, and it was recommended that the administration of the Army Classification Battery test be postponed for several weeks in the enlisted man's career. It was also concluded that there was a relationship between the level of formal education and the demonstrated efficiency of enlisted men. The level of education considered in this study being high school or its equivalence.

This study appeared to be a pilot study. It was therefore recommended that the study be replicated several more times under more controlled conditions, especially the stabilizing of the test population. Once the test population was selected, no man should be transferred until the study was completed.